MANAGEMENT OF DAS, NAS, CAS & SAN

1. Management of DAS:

- DAS is the traditional method of locally attaching storage devices to servers via a direct communication path between the server and storage devices.

- As shown in Figure 1, the connectivity between the server and the storage devices are on a dedicated path separate from the network cabling.

- Access is provided via an intelligent controller. The storage can only be accessed through the directly attached server.

- This method was developed primarily to address shortcomings in drive-bays on the host computer systems.

- When a server needed more drive space, a storage unit was attached. This method also allowed for one server to mirror another.

- The mirroring functionality may also be accomplished via directly attached server to server interfaces.

- A disk subsystem that is directly connected to a host rather than going through a switched network, thereby giving the host exclusive access to the disks.

- The category obviously includes disks internal to a physical server, but in the storage realm we most often think about JBOD ("just a bunch of disks") shelves attached to a server via SAS cable.
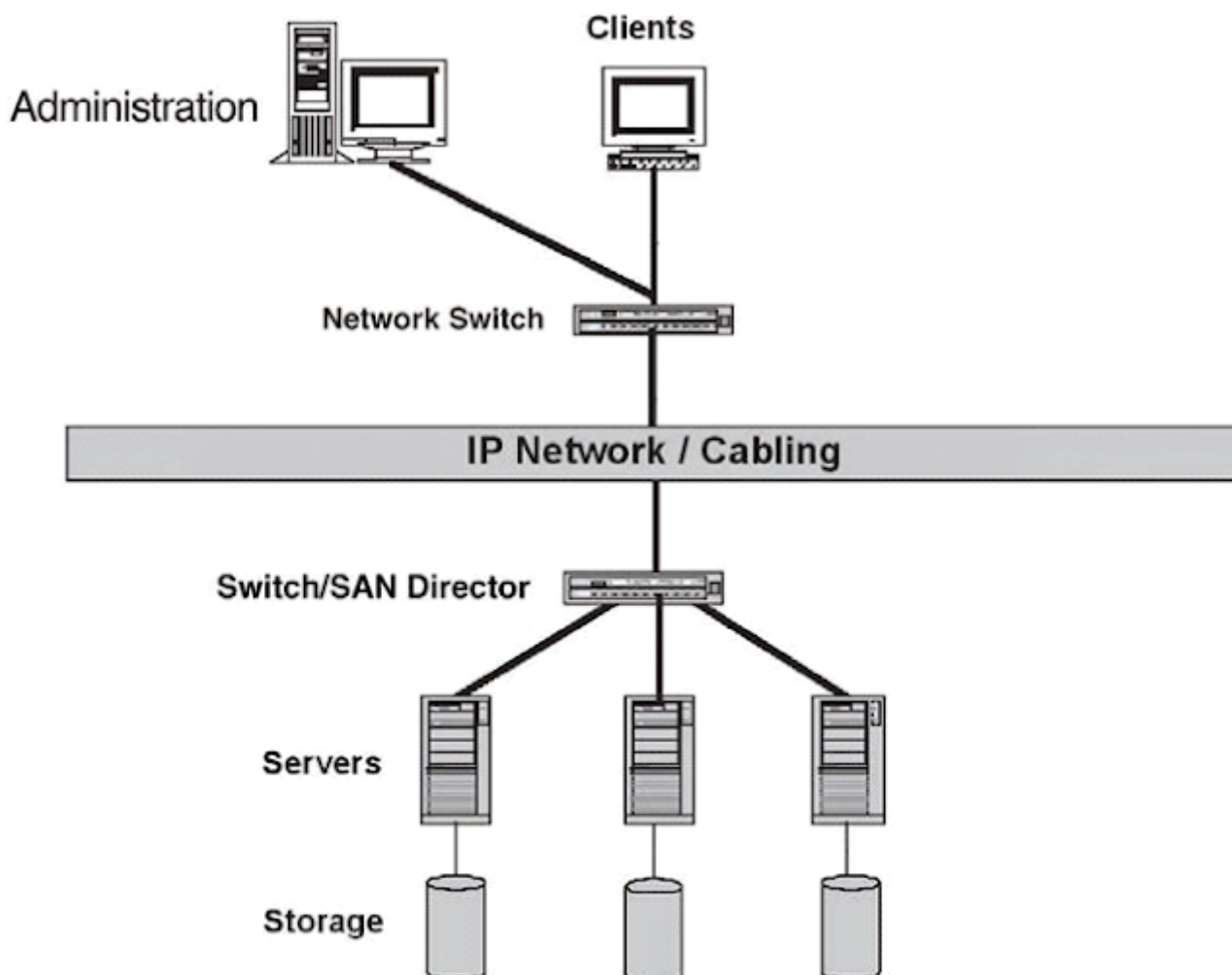
Figure 1: A Simple DAS Diagram

2. Management Of NAS:

- Network Attached Storage is a backup and storage system that is used within organizations that have a large number of departments that require storage of large amounts of data on a central server.

- With Network Attached Storage the data storage is configured with its own network address instead of being associated with the department server and the department computer.

- A system that does not have Network Attached Storage has the hard diak data storage located on the department server which is attached to the department computer. This type of set up can significantly slow down the processing speed of the applications that are delivered to all of the workstations on the network.

- With a Network Attached Storage System the hard disk storage access is located separate from the department server with an exclusive network IP address on a local area network.

- This allows faster service on the department server for file transfer and business software applications. Data can still be accessed by the client workstations through a file request map that is channeled to the Network Attached Storage system on the local area network server.
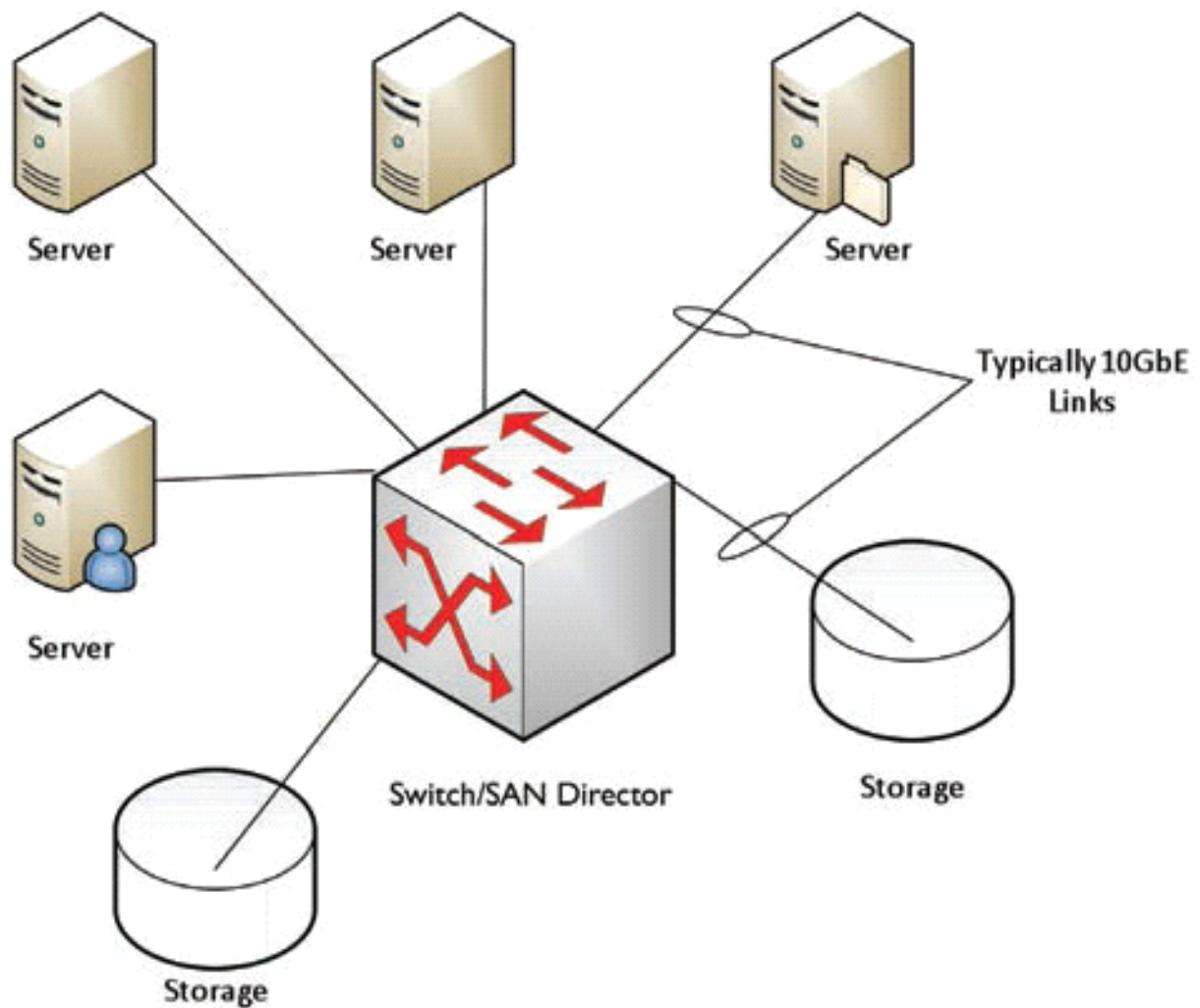
Figure 2: Simple NAS Architecture

3. Management Of CAS:

- **CAS** is a way of storing information that can be retrieved based on its content, instead of its storage location.

- It's typically used for long-term storage and retrieval of fixed content, like documents stored with compliance for government regulations, or medical records like x-rays and MRIs.

- In other words, when you think about storage, everything has an address. For conventional file systems, it's a name and a location in a hierarchy of directories.

- A CAS system uses the content itself as an address through a unique identifier, typically using a hashing algorithm performed against the content. That makes the content address unique. No two pieces of content have the same address unless the content is exactly the same.

- When a content address is provided to the device, it first queries the directory for the physical location of the specified content address. The information is then retrieved from a storage node, and the actual hash of the data recomputed and verified. Once this is complete, the device can supply the requested data to the client.
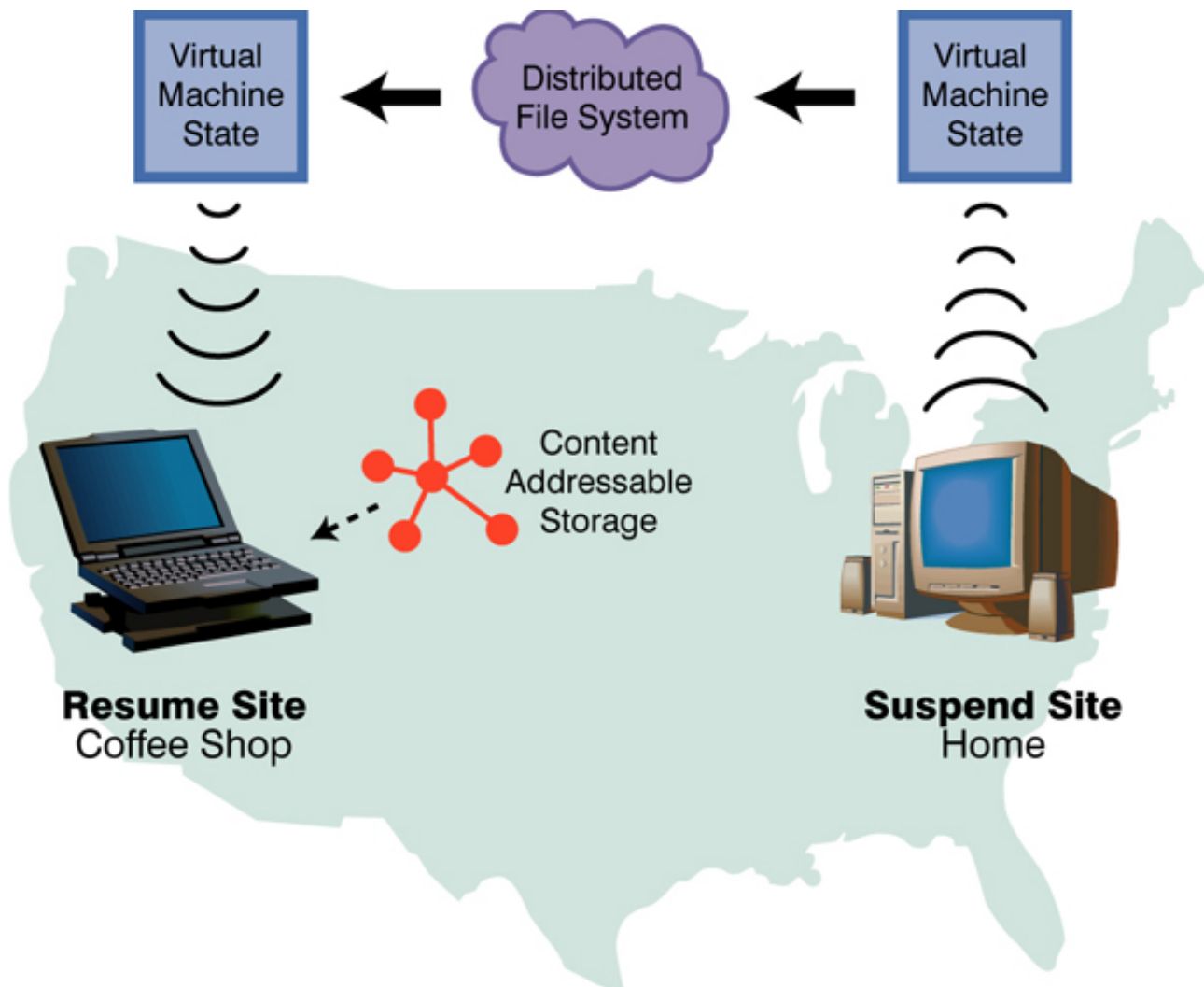
Figure 3: CAS Architecture

4. Management Of SAN:

- SAN (*storage area network*) is a high-speed network of storage devices that also connects those storage devices with servers.
- It provides block level storage that can be accessed by the applications running on any

networked servers.
- SAN storage devices can include tape libraries and disk-based devices, like RAID hardware. SANs are particularly helpful in backup and disaster recovery settings. Within a SAN, data can be transferred from one storage device to another without interacting with a server.
- This speeds up the backup process and eliminates the need to use server CPU cycles for backup. Many SANs utilize Fibre Channel technology or other networking protocols that allow the networks to span longer distances geographically. That makes it more feasible for companies to keep their backup data in remote locations.
- Utilizing a SAN can also simplify some management tasks, potentially allowing organizations to hire fewer IT workers or to free up some IT workers for other tasks.

- It's also possible to boot servers from a SAN, which can reduce the time and hassles involved in replacing a server
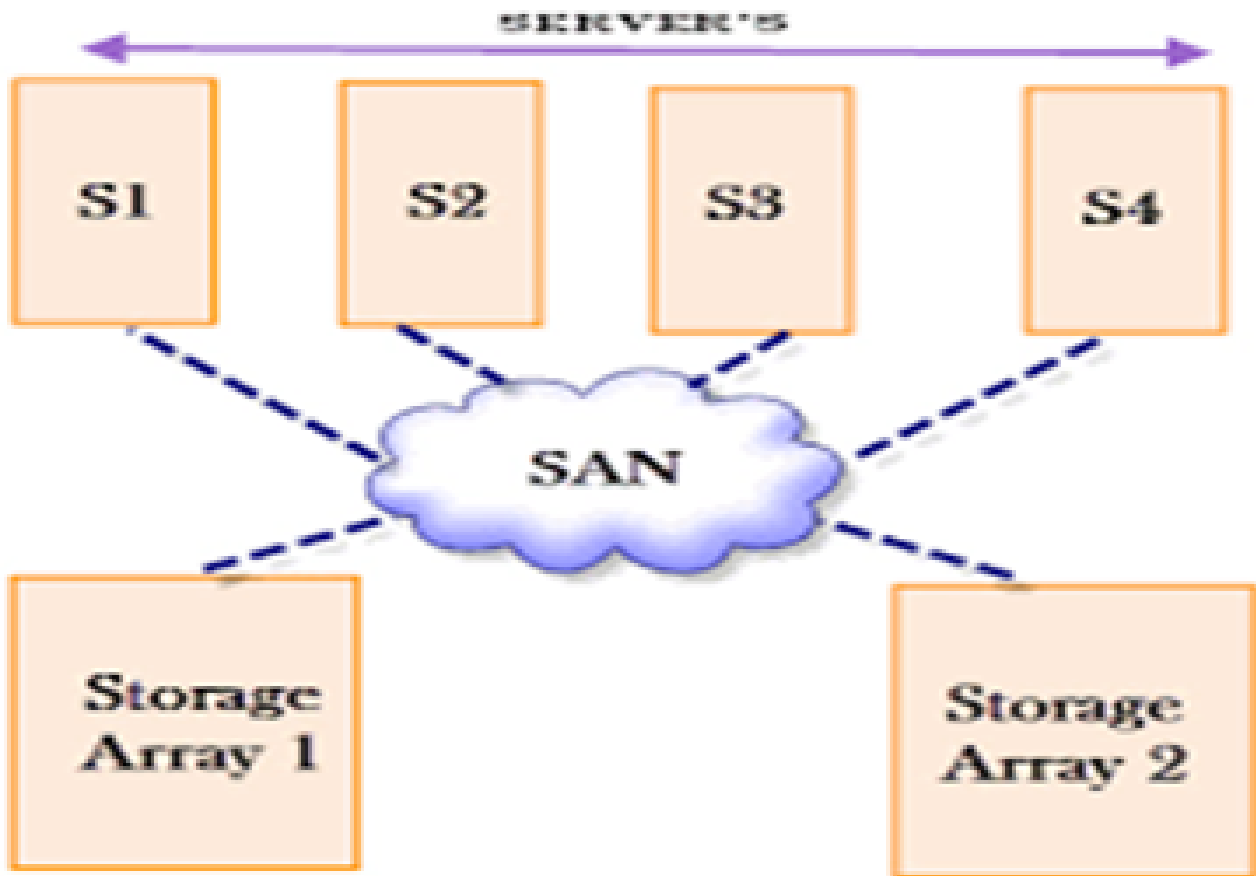
Figure 4: Simple SAN Architecture

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